

**Characteristics of Barrier Layers Produced on R/F Foam Shells
by Acid Chloride Interfacial Polymerization.**

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To be useful as a target, a foam shell must have a full density barrier layer conformal to the exterior surface of the foam. To create this coating, we have been exploring interfacial polymerization using an acid chloride condensation reaction with an alcohol or phenol. A series of reactants have been tested. The reactants varied both in functionality and aliphatic or aromatic structure. We also used two organic solvents, one aliphatic and one aromatic, to test for solvency effects. Our objective in using this design was to reveal the range of coating properties possible. This report summarizes the properties of the coatings produced, first using single reactants in each phase, secondly using blends of reactants in the aqueous phase. With single reactants the variation in coating quality was significant, but no one coating had the optimum in all of the responses, i.e. minimal shrinkage, good optical transmission, and good surface finish. The second experimental design blended reactants, specifically poly(vinyl alcohol) and poly(vinyl phenol) with low molecular weight di- and trifunctional phenols and amines. Some of the coatings produced were improved in modulus, permeation properties, and surface finish.

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